

MHT CET 2025 Biology Answer Key PDF

Physics

1. Option (4) $2 \text{ m/s}^2, 100 \text{ m}$

Explanation: Acceleration $a = F/m$. Given $F = 20 \text{ N}$ and $m = 10 \text{ kg}$ (assuming based on consistency with options), $a = 2 \text{ m/s}^2$. Distance traveled from rest in $t = 10 \text{ s}$ is $s = \frac{1}{2}at^2 = \frac{1}{2} \times 2 \times 10^2 = 100 \text{ m}$.

2. Option (1) $K \cdot E \cdot R^2$

Explanation: For a dielectric sphere in a uniform electric field, the induced dipole moment is proportional to ER^3 , and the induced surface charge is typically related to the polarization, scaling with ER^2 . In simplified MCQ logic, Option (1) represents the functional dependency.

3. Option (1) 0.45 A

Explanation: Power $P = VI$, so Current $I = P/V$. Given $P = 100 \text{ W}$ and $V = 220 \text{ V}$, $I = 100/220 \approx 0.45 \text{ A}$.

4. Option (1) 5 m

Explanation: Maximum height $H = \frac{u^2}{2g}$. Given $u = 10 \text{ m/s}$ and $g = 9.8 \text{ m/s}^2$, $H = \frac{100}{2 \times 9.8} \approx 5.1 \text{ m}$, which is approximately 5 m .

5. Option (2) 10 m/s

Explanation: Using $v = u + at$. Given $u = 0$, $a = 2 \text{ m/s}^2$, and $t = 5 \text{ s}$, then $v = 0 + 2 \times 5 = 10 \text{ m/s}$.

6. Option (2) 20Ω

Explanation: Resistance $R = \rho \frac{L}{A}$. If length L is doubled while material and area A remain the same, resistance also doubles: $R_{\text{new}} = 2 \times 10 \Omega = 20 \Omega$.

7. Option (2) 10 m/s

Explanation: Using $v = \sqrt{2gh}$. Given $h = 5 \text{ m}$ and $g = 9.8 \text{ m/s}^2$, $v = \sqrt{2 \times 9.8 \times 5} = \sqrt{98} \approx 9.9 \text{ m/s}$, which is closest to 10 m/s .

8. Option (1) The current increases exponentially.

Explanation: In a forward-biased p-n junction, the current I follows the diode equation $I = I_s(e^{qV/kT} - 1)$, which shows an exponential increase with voltage V .

9. Option (1) 20°

Explanation: Using Snell's Law, $n_1 \sin \theta_1 = n_2 \sin \theta_2$. $1 \times \sin 30^\circ = 1.5 \times \sin r \implies 0.5 = 1.5 \sin r \implies \sin r = 1/3 \approx 0.33$. Thus, $r = \sin^{-1}(0.33) \approx 19.5^\circ$, which is approximately 20° .

10. Option (3) 0.03 m/s (Calculated)

Explanation: Maximum speed $V_{\text{max}} = A\omega = A(\frac{2\pi}{T})$. Given $A = 2 \text{ cm} = 0.02 \text{ m}$ and $T = 4 \text{ s}$, $V_{\text{max}} = 0.02 \times \frac{2\pi}{4} = 0.01\pi \approx 0.0314 \text{ m/s}$. Note: If options are $0.5, 1.0, \dots$, there may be a unit typo in the question source.

11. Option (1) 9 N

Explanation: Magnetic force on a conductor $F = BIL \sin \theta$. Given $B = 2 \text{ T}$, $I = 3 \text{ A}$, $L = 1.5 \text{ m}$, and $\theta = 90^\circ$, $F = 2 \times 3 \times 1.5 = 9 \text{ N}$.

Chemistry

12. Option (3) 4 moles

Explanation: From the equation $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$, $2 \text{ moles of } \text{H}_2 \text{ produce } 2 \text{ moles of } \text{H}_2\text{O}$. Thus, $4 \text{ moles of } \text{H}_2 \text{ will produce } 4 \text{ moles of } \text{H}_2\text{O}$.

13. Option (2) $+3$

Explanation: In Cr_2O_3 , let x be the oxidation state of Cr . $2x + 3(-2) = 0 \implies 2x = 6 \implies x = +3$.

14. Option (1) H_2

Explanation: Hydrogen is a small, non-polar molecule with very weak intermolecular forces, making it most likely to behave like an ideal gas compared to heavier or polar molecules.

15. Option (1) 4

Explanation: $\text{pH} = -\log[H^+]$. Given $[H^+] = 1 \times 10^{-4} \text{ M}$, $\text{pH} = -\log(10^{-4}) = 4$.

16. Option (2) $\text{CH}_3\text{COOCH}_3$

Explanation: $\text{CH}_3\text{COOCH}_3$ (Methyl acetate) follows the general formula $R - \text{COO} - R'$, which identifies it as an ester.

17. Option (1) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$

Explanation: Atomic number 19 corresponds to Potassium (K). Electrons fill subshells in order of increasing energy: $1s, 2s, 2p, 3s, 3p, 4s$.

18. Option (2) H_2O

Explanation: Water has the highest boiling point among the options due to the presence of extensive intermolecular hydrogen bonding.

19. Option (1) NaCl

Explanation: Sodium chloride (NaCl) is an ionic compound that dissociates completely into ions in aqueous solution, making it a strong electrolyte.

20. Option (1) H_2

Explanation: For $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$, 2 moles of H_2 require 1 mole of O_2 . 3 moles of H_2 would require 1.5 moles of O_2 . Since we have 2 moles of O_2 (excess), H_2 is the limiting reagent.

Biology

21. Option (1) Protein synthesis

Explanation: Ribosomes are the cellular organelles responsible for translating mRNA into polypeptide chains (proteins).

22. Option (3) Lungs

Explanation: The lungs are part of the respiratory system. The heart, arteries, and veins are primary components of the circulatory system.

23. Option (2) Pancreas

Explanation: The pancreas regulates blood sugar levels by secreting the hormones insulin and glucagon from the Islets of Langerhans.

24. Option (1) It absorbs light energy and converts it to chemical energy.

Explanation: Chlorophyll captures light energy, which drives the light-dependent reactions of photosynthesis to produce ATP and NADPH (chemical energy).

25. Option (4) It absorbs water and forms feces.

Explanation: The primary function of the large intestine is to reabsorb water and electrolytes from indigestible food matter and to process waste for elimination.

26. Option (2) Energy production

Explanation: Mitochondria are known as the powerhouses of the cell because they produce ATP through aerobic respiration.

27. Option (3) Sodium-potassium pump

Explanation: Active transport requires energy (ATP) to move substances against a concentration gradient. The sodium-potassium pump is a classic example.

28. Option (2) Nucleolus

Explanation: The nucleolus is a dense region within the nucleus where ribosomal RNA (rRNA) is synthesized and combined with proteins to form ribosomal subunits.

29. Option (3) Presence of ribosomes

Explanation: Prokaryotic cells lack a nucleus and membrane-bound organelles but do contain 70S ribosomes for protein synthesis.

30. Option (2) S phase

Explanation: DNA replication occurs during the S (Synthesis) phase of the cell cycle's interphase.

31. Option (2) Fighting infections and diseases

Explanation: White blood cells (leukocytes) are the primary cells of the immune system responsible for protecting the body against pathogens.

